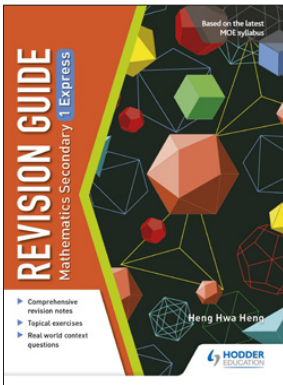


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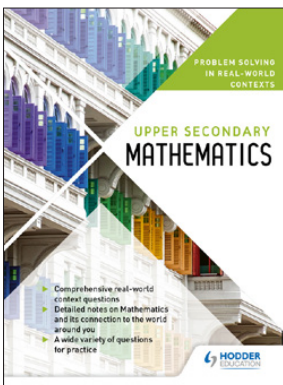
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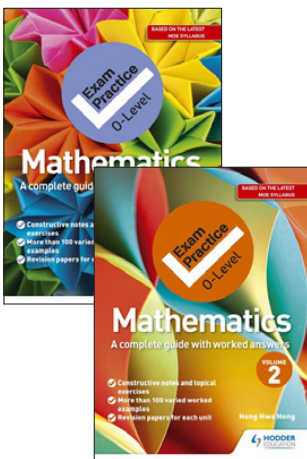


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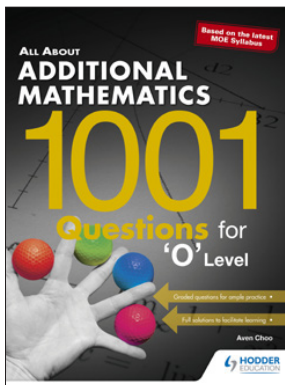
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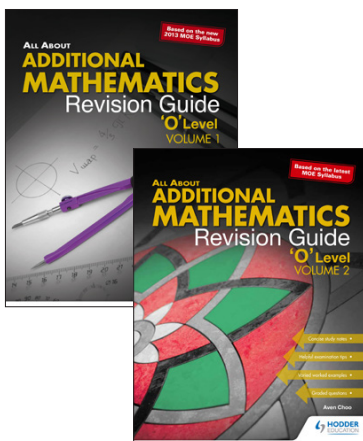
TOPIC 1 Simultaneous Equations

- Find the coordinates where the straight line $y - 1 = 2x$ meets the curve $x^2 - 2xy - y^2 = 1$.
- Solve the simultaneous equations:
 $(2x + 3y)^2 + 2y = 10$
 $y - 2x = 1$
- The line $y - 3 = 2x$ intersects the curve $20 + xy = 5y$ at P and Q . Calculate the coordinates of P and Q .
- Find the points of intersection where the line $y = -3x + 1$ meets the curve $x^2 + 2xy + 2y^2 = 25$.
- The line $y - 3x - 1 = 0$ intersects the curve $2x^2 + y - 11x + 5 = 0$ at A and B . Find A and B .
- Solve the simultaneous equations:
 $8x^2 - 3y^2 = 6$
 $2x + y - 5 = 0$
- Find the points of intersection of the straight line $2x + 3y = 10$ and the curve $\frac{x}{y} + \frac{y}{x} = 5$.
- Find the points of intersection of the line $x + 2y = 1$ and the curve $3x^2 + 5xy - 2y^2 = 10$.
- Find the points of intersection of the line $2x + y = 3$ and the curve $2x^2 + y^2 - 4x = 39$.
- The line $12x - 6y = 1$ meets the curve $2x^2 + 6x + 2 + y$ at points A and B . Find A and B .
- Given that $(-2, 2)$ is a solution to the simultaneous equations $x + \frac{2}{y} = \frac{3}{2}$ and $\frac{1}{x} + \frac{2}{y} = k$, find the values of k and of k . Hence, find the other solution.
- The line $2y - x - 5$ intersects the curve $\frac{2x}{y} - \frac{y}{x} = 1$ at the points A and B . Find the midpoint of AB .
- The line $2x + y - 2 = 0$ meets the curve $\frac{1}{x} + \frac{2}{y} = \frac{3}{2}$ at the points A and B . Find the coordinates of points A and B in exact form.
- The price of a pencil is lower than that of a pen. The prices are such that 5 times the square of the price of a pencil subtracted from the square of the price of a pen is equal to the difference in their prices. The price of a pen and five pencils is equal to 5 times the difference in their prices. Find the price of three pens and four pencils.
- The numbers P and Q , where $Q > P$, are such that the sum of $\frac{1}{Q}$ and $\frac{1}{P}$ equals to 1. Twice the difference of the square of P and square of Q gives a number equal to 5 times the square of Q subtracted from the number 20. Find the numbers P and Q .

TOPIC 1 Simultaneous Equations 3

- Find the points of intersection of the line $y + 1 = 3x$ and the curve $2x^2 + 2y^2 - x + y - 11 = 0$.
- The line $2y - 3x = 1$ intersects the curve $15y - 28x = xy$ at the points A and B . Find the midpoint of AB .
- The line $3x + y = 2$ intersects the curve $x^2 + y^2 - 2xy = 36$ at the points P and Q . Find the length of PQ , leaving your answer in exact form.
- Solve the simultaneous equations of $\frac{x}{2} + \frac{y}{3} = 5$ and $2y - x = 2$. Hence, find the length from this intersection point to the origin, leaving your answer in exact form.
- Given that the point $(k, -2)$ lies on the line $3x + 2y = 8$ and the curve $kx^2 + 3y + y^2 + 4 = 0$. Find the value of k and of k . Hence, determine the other point of intersection of the line and the curve. Hence, find the midpoint of the points of intersection.
- The line $3x + 2y = 6$ intersects the curve $6(x - 2)^2 + (y - 3)^2 = 49$ at A and B . Find A and B .
- Solve the simultaneous equations $y^2 = 2x + 1$ and $x + 2 = 2y$.
- Given that $(\frac{3}{2}, \frac{1}{2})$ is one of the points of intersection for the simultaneous equation $kx - hy = 5$ and $kx + 4y = 2x$, find the value of k and of h . Hence, find the other point of intersection.
- Given that $(2, 5)$ is a solution to the simultaneous equations $px + qy = 3$ and $x^2 + 2yq - y^2 + 1 = 0$, find the value of p and of q .
- Find the points of intersection A and B of the curve $2xy = -1$ and the line $3x + 2y + 2 = 0$. Hence, find the equation of the perpendicular bisector of AB .
- Given that $(2, 3)$ is a solution to the simultaneous equation $a^2x - by = 50$ and $ax + by = 10$, find the possible values of a and of b .
- Show that the line $2x - 3y = 7$ passes through one of the points at which the straight line $2x - 6y = 10$ meet the curve $x^2 - 2y^2 = 3y + 3x - 6$.
- Solve the following simultaneous equations:
 $3y - x - 1 = \frac{2}{y} - \frac{1}{x} - 2$
- The line $2x - 4 - 2y$ cuts the curve $\frac{2x}{y} + \frac{2y}{x} - 5 = \frac{18}{10}$. Find the point of intersection. Hence, find the gradient of the straight line that passes through this point intersection and the origin.
- The line $2x + y = 10$ cuts the circle $2x^2 + 2y^2 - 8x - 4y - 10 = 0$ at the points P and Q . Find P and Q . Hence, find the length of PQ , leaving your answer in exact form.
- Given that the circle $3x^2 + 3y^2 - 12x + 12y = 51$ meets the line $0.5x + 1.5y = 5.5$ at A and B , show that the line $3x - 2y = 0$ passes through one of the points of intersection.
- A positive two-digit number is 4 times the sum of its digits, while the sum of the squares of its digits is 45. Find the number.

4 TOPIC 1 Simultaneous Equations



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